

transmission or distribution network, wherein the voltages can be above or below 36 kV being across the range of transmission or distribution voltages.

Claim 2. The plant as claimed in claim 1 wherein the winding includes an insulation system comprising at least two semiconducting layers, each layer constituting essentially an equipotential surface, and also intermediate solid insulation wherein at least one of the layers has substantially the same coefficient of thermal expansion as the solid insulation.

Claim 3. The plant as claimed in claim 1, wherein the generator comprises a magnetic circuit with a magnetic core.

Claim 4. The plant as claimed in claim 3, wherein the electric machine includes a core comprising laminated sheet of at least one of cast iron, powder-based iron, and rough forge iron.

Claim 5. (Thrice Amended) The plant as claimed in claim 1 wherein the winding comprises a cable and the solid insulation covering comprises inner and outer semiconducting layers and an intermediate insulating layer of solid insulation [surrounding the conductors].

Claim 6. The plant as claimed in claim 5, wherein the inner semiconducting layer is at substantially the same potential as the conductors.

Claim 7. The plant as claimed in claim 5, wherein the outer semiconducting layer forms an equipotential surface surrounding the conductors.

Claim 8. The plant as claimed in claim 7, wherein said outer semiconducting layer is connected to a predefined potential

Claim 9. The plant as claimed in claim 8, wherein the predefined potential is earth potential.

Claim 10. The plant as claimed in claim 5, wherein at least two of said layers have substantially the same coefficient of thermal expansion.

Claim 11 has been canceled.

Claim 12 has been canceled.

Claim 13. (Amended) The plant as claimed in claim [12]1, wherein the cable also comprises a metal screen and a sheath.

Claim 14. The plant as claimed in claim 1 including a stator cooled at earth potential by means of a fluid.

Claim 15. The plant as claimed in wherein the outer semi-conducting layer is connected to earth potential.

Claim 16. The plant as claimed in claim 1, wherein the electric machine includes a rotor inductively connected to the high voltage.

Claim 17. The plant as claimed in claim 16, wherein the rotor is cylindrical in shape, has salient poles and also has a constant air gap.

Claim 18. The plant as claimed in claim 17, wherein the electric machine includes a stator having a stator winding formed as at least one of an integral slot winding, and a fractional slot winding.

Claim 19 has been canceled.

Claim 20. The plant as claimed in claim 18, wherein the stator has a pole pitch and the winding is distributed and includes a coil having a coil span different from the pole pitch.

Claim 22. The plant as claimed in claim 5 wherein the cable has a conductor area of about between 40 and 3000 mm² and an outer cable diameter of about between 20 and 250 mm.

Claim 23. The plant as claimed in claim 22, wherein the cable is cooled by gas or liquid inside current-carrying conductors.

Claim 24. The plant as claimed in claim 1, wherein the electric machine is designed for high voltage and arranged to supply the out-going electric network directly without any intermediate connection of a transformer.

Claim 25. The plant as claimed in claim 1, comprising a plurality of electric machines, each of which lacks an individual step-up transformer, but which, via a system transformer common to the electric machines, is connected to the transmission or distribution network.

Claim 26. The plant as claimed in claim 24, wherein at least one electric machine is earthed via an impedance.

Claim 27. The plant as claimed in claim 24, wherein electric machine is directly earthed.

Claim 28. The plant as claimed in claim 24, wherein said plant is operative as at least one of a pump and turbine station, the electric machine being arranged to function as at least one of a motor driven directly from the transmission or distribution network and as a generator, generating voltage for the transmission or distribution network.

Claim 29. The plant as claimed claim 24, wherein the electric machine is arranged to generate power to various voltage levels.

Claim 30. The plant as claimed in claim 29, wherein at least one electric machine includes a separate auxiliary winding for producing auxiliary power at one of said voltage levels.

Claim 31. The plant as claimed in claim 1, including a common earth system.

Claim 32. The plant as claimed in claim 1, wherein the winding of the electric machine is operable for self-regulating field control and lacks auxiliary means for control of the field.

Claim 33. (Thrice Amended) [A procedure for constructing a] The plant as claimed in claim 1, wherein the electric machine includes a stator comprising [at least one of separate stator limitations and combined stacks] a plurality of stator laminations having openings for receiving the winding, said [parts] laminations being assembled into a stack with the openings aligned [on site], and the winding comprises a cable threaded into the openings or the stacking laminations of the stator [threading of the winding and any splicing on site]at the manufacturing facility or at the generation plant site.

Claim 34. (Amended) An electric generator for high voltage included in a hydro-generator plant in which the generator is coupled to a turbine via shaft means, said generator comprising at least one winding including a conductor, a solid insulation covering including an insulating layer and at least one semiconducting layer surrounding said conductor and wherein each winding is directly connectable to a high voltage transmission or distribution network at voltages above or below 36kV.

Claim 37. (Amended) A hydrogenerator plant including a rotating high voltage electric machine comprising a stator; a rotor and a winding, wherein said winding comprises a cable including a current-carrying conductor and a magnetically permeable, electric field confining cover surrounding the conductor, said cable forming at least one uninterrupted turn in the corresponding winding of said machine, and wherein the conductor includes a plurality of insulated conductive strands and at least one uninsulated electrically conductive strand in contact with the cover and electric field confining winding, flexible and capable of temperatures withstand.

Claim 38. The hydrogenerator plant of claim 37, wherein the cover comprises an insulating layer surrounding the conductor and an outer layer surrounding the insulating layer, said outer layer having a conductivity sufficient to establish an equipotential surface around the conductor.

Claim 39. The hydrogenerator plant of claim 37, wherein the cover comprises an inner layer surrounding the conductor and being in electrical contact therewith; an insulating layer surrounding the inner layer and an outer layer surrounding the insulating layer.

Claim 40. The hydrogenerator plant of claim 39, wherein the inner and outer layers have semiconducting properties.

Claim 41. The hydrogenerator plant of claim 37, wherein the cover is formed of a plurality of integrally bonded layers, and wherein said plurality of layers are substantially void free.

Claims 42 through 49 have been canceled.